REMARKS

Claims 1-34 are now pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejection(s) in view of the amendments and remarks contained herein.

I. *Drawings*

The drawings have been amended according to the Examiner's suggestions. Attached herewith is a Request for Approval of Drawing Changes.

II. *Claim Objections*

Claims 1, 3, 4, 14, 19, 20, 26 and 31 are objected to for certain informalities. Applicants have amended Claims 1, 3, 4, 14, 19, 20, 26 and 31 according to the Examiner's recommendations. Therefore, withdrawal of this objection is respectfully requested.

III. *Double Patenting*

The Examiner has rejected Claims 1-8, 11, 12, 14-21 and 24-32 based on obviousness-type double patenting as being unpatentable over Claims 1-36 of co-pending Application No. 09/767,202 in view of Smiley. Applicant submits herewith a Terminal Disclaimer in accordance with 37 C.F.R. §1.130(b) to obviate the obviousness-type double patenting rejection. Also attached herewith is a statement establishing the right of the assignee to take action in this matter, pursuant to 37 C.F.R. §3.73(b).

IV. *Claim Rejections Under 35 U.S.C. §103*

In view of the Terminal Disclaimer filed herewith, Applicants shall address all claim rejections under 35 U.S.C. §103(a) without regard to Smiley.

Claims 1-6 and 14-19 are rejected under 35 U.S.C. §103(a) as being unpatentable over the text of Applicants' application in view of Ullman et al. (U.S. Patent No. 5,903,583) and Brauch et al. (U.S. Patent No. 5,553,088).

At the outset, it will be noted that independent Claims 1 and 14 include the limitation of "a plurality of laser gain medium elements". The Examiner acknowledges the text of the present application does not disclose a plurality of laser gain medium elements. Furthermore, Applicants respectfully assert that the combination of Ullman '583 and Brauch '088 does not create or teach the Applicants' named invention, in particular the plurality of laser gain elements. Ullman '583 teaches a method for producing a multilayer cooling element while Brauch '088 teaches a method for maintaining a laser active material at a high pumping power through the use of a cooling surface. Neither Ullman '583 or Brauch '088 teach or suggest "a plurality of laser gain medium elements" as claimed. Accordingly, Applicants submit this combination is improper as obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under 35 U.S.C. §103, teachings of references can be combined only if there is some suggestion or incentive to do so. ACS Hosp. Sys., Inc., v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984).

Furthermore, it is improper to assume that one of ordinary skill in the art would modify the teachings of Ullman '583 and Brauch '088 to arrive at the claimed invention without some teaching, suggestion or motivation being apparent from the references. In particular, "to imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is

to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor is taught is used against its teacher." In re Fine, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (citing W.L. Gore & Assocs. V. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983)). Therefore, Applicants respectfully assert independent Claims 1 and 14 define over the prior art and request reconsideration and withdrawal of these rejections.

Claims 7 and 8 are rejected under 35 U.S.C. §103(a) as being unpatentable over the text of Applicant's application in view of Ullman '583, Brauch '088 and further in view of Powell (U.S. Patent No. 4,849,036). Applicant notes that Claims 7 and 8 depend from independent Claim 1, which is believed to be in condition for allowance. Accordingly, Applicants submit Claims 7 and 8 are also in condition for allowance and request reconsideration and withdrawal of this rejection.

Claims 11 and 12 are rejected under 35 U.S.C. §103(a)as being unpatentable over the text of Applicants' application in view of Ullman '583, Brauch '088 and further in view of Meissner (U.S. Patent No. 5,936,984). Applicants note Claims 11 and 12 depend from independent Claim 1 which should now be in condition for allowance. Accordingly, Applicants submit Claims 11 and 12 are also in condition for allowance and request reconsideration and withdrawal of this rejection.

Claims 20 and 21 are rejected under 35 U.S.C. §103(a) as being unpatentable over the text of Applicants' application in view of Ullman '583, Brauch '088 and further in view of Meissner '984. Applicant notes Claims 20 and 21 depend from independent Claim 14 which should now be in condition for allowance. Accordingly, Applicant submits Claims 20

and 21 are also in condition for allowance and request reconsideration and withdrawal of this rejection.

Claim 24 is rejected under 35 U.S.C. §103(a) as being unpatentable over the text of Applicant's application in view of Ullman '583, Brauch '088 and further in view of Powell '036. Applicant notes that Claim 24 depends from independent Claim 14 which is now in condition for allowance. Accordingly, Claim 24 should also be in condition for allowance, and reconsideration and withdrawal of this rejection is requested.

Claim 25 is rejected under 35 U.S.C. §103(a) as being unpatentable over the text of Applicant's application in view of Ullman '583, Brauch '088 and further in view of Basu. Applicant notes that Claim 25 depends from independent Claim 14 which should now be in condition for allowance. Accordingly, Applicant submits that Claim 25 is also in condition for allowance and requests reconsideration and withdrawal of this rejection.

Claims 26-31 are rejected under 35 U.S.C. §103(a) as being unpatentable over the text of Applicant's application in view of Brauch '088.

At the outset, it will be noted that independent Claim 26 has been amended to include the limitation of "a plurality of laser gain medium elements". The Examiner has previously acknowledged that the text of the present application does not disclose a plurality of laser gain medium elements. Furthermore, it is respectfully asserted that the combination of the instant application and Brauch '088 does not create or teach the present invention, in particular the plurality of laser gain elements. Specifically, Brauch '088 teaches a method for maintaining a laser active material at a high pumping power through the use of a cooling surface. Brauch '088 does not teach or suggest "a plurality of laser gain medium elements" as claimed. Accordingly, it is submitted that this combination

is improper as obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under 35 U.S.C. §103, teachings of references can be combined only if there is some suggestion or incentive to do so. ACS Hosp. Sys., Inc., v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). Therefore, Applicant respectfully asserts that independent Claim 26 defines over the prior art and requests reconsideration and withdrawal of this rejection. Furthermore, Claims 27-31 depend from independent Claim 26 which is now believed to be in condition for allowance. Accordingly, Claims 27-31 are also believed to be in condition for allowance.

Claim 32 is rejected under 35 U.S.C. §103(a) as being unpatentable over the text of Applicant's application in view of Brauch '088 and Meissner '984. Claim 32 depends from independent Claim 26, which is now believed to be in condition for allowance. Accordingly, Claim 32 is also believed to be in condition for allowance and request reconsideration and withdrawal of this rejection.

IV. ***Conclusion***

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: Jan 20, 2003

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ATTACHMENT FOR SPECIFICATION AMENDMENTS

The following is a marked up version of each replacement paragraph and/or section of the specification in which underlines indicates insertions and brackets indicate deletions.

[0070] During lasing, optical pump source 68 produces and directs collimated optical pump radiation 36 into the back surface [182] 24 of the substrate 146. Since the substrate 146 and the coolant 52 are optically transparent at the pump radiation wavelengths, the pump radiation 36 is transported through them and through the optical coating 21 into the laser gain medium 126 of the composite gain media 112a-112g. The fraction of the pump radiation 36 not absorbed on the first pass through the laser gain medium 126 is reflected from the coating 41 and makes a second pass through the laser gain medium, this time in a generally reverse direction. Absorption of pump radiation 36 pumps the laser gain medium 126 to a laser transition. A key benefit provided by the second preferred embodiment of the invention is that the optical pump source 68 does not compete for space with laser beam 64 and 64'.

ATTACHMENT FOR CLAIM AMENDMENTS

The following is a marked up version of each amended claim in which underlines indicates insertions and brackets indicate deletions.

1. (Amended) A solid-state laser module for amplification of laser radiation comprising:

a substrate having a front surface and a back surface, said front surface of said substrate having a plurality of channels formed therein;

a plurality of laser gain medium elements, each of said laser gain medium elements having a front surface, a back surface and a peripheral edge surface, said back surfaces of said laser gain [media] medium elements being in contact with said front surface of said substrate;

a source of optical pump radiation for directing optical pump radiation into said plurality of laser gain medium elements;

wherein said channels are maintained at a [reduced] pressure such that a pressure differential is created between said front surface and said back surface of each said laser gain medium element to thereby maintain each said laser gain medium element secured against said front surface of said substrate;

wherein each of said plurality of laser gain medium elements are placed closely adjacent one another such that a peripheral edge of each is positioned closely adjacent a peripheral edge of another one of said laser gain medium elements; and

wherein at least one of said laser gain medium elements has an optical coating on said back surface thereof to provide high reflectivity at a lasing wavelength of said laser gain [media] medium elements;

wherein at least one of said laser gain medium elements has an optical coating on said front surface thereof, said coating being antireflective at a lasing wavelength of said laser gain medium element; and

wherein said substrate is cooled.

2. (Amended) The laser module of Claim 1, further comprising a cooling medium flowing through said channels for cooling said laser gain [media] medium elements.

3. (Amended) The laser module of Claim 1 wherein each said laser gain [media] medium elements comprises a host lattice and an undoped optical medium and wherein said host lattice and said undoped optical medium are selected from [the] a group consisting of: yttrium aluminum garnet, gadolinium gallium garnet, gadolinium scandium gallium garnet, lithium yttrium fluoride, yttrium vanadate, phosphate glass, silicate glass and sapphire.

4. (Amended) The laser module of Claim 3 wherein said host lattice is doped with a material selected from [the] a group of: Ti, Cu, Co, Ni, Cr, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm and Yb.

11. (Amended) The laser module of Claim 1 further including an undoped optical medium attached to said peripheral edge of said laser gain [media] medium elements;

wherein said optical pump radiation is directed into said undoped optical medium, said undoped optical medium transporting said optical pump radiation into an associated one of said laser gain media elements; and

wherein said undoped optical medium is secured to said peripheral edge via a bond which is transparent at a wavelength of said optical pump radiation and a lasing wavelength of said laser gain media.

14. (Amended) A solid-state laser module comprising:

(a) a rigid substrate having a plurality of internal passages forming channels within a support surface of said rigid substrate, said passages leading up to the surface of said substrate and being maintained at a substantially lower pressure than an atmosphere in which said laser module is immersed;

(b) a plurality of laser gain medium elements disposed closely adjacent one another and against said support surface, each of said laser gain medium elements effectively having a pair of surfaces having a first dimension, said pair of surfaces further being opposite to each other and being separated by a peripheral edge surface, each of said laser gain medium elements having a thickness representing a second dimension which is substantially smaller than said first dimension;

i) a first one of said pair of surfaces including an anti-reflection coating which is substantially [totally] transmissive of radiation at a wavelength at which laser gain is produced therein;

ii) said second [surface] one of said pair of surfaces including a coating which is substantially [totally] reflective of radiation at a laser gain wavelength;

iii) said second one of said pair of surfaces being disposed against said support surface of said substrate and maintained so by a pressure differential between pressure in said passages and said atmosphere in which said laser module is immersed; and

at least one source of optical pump radiation directing optical pump radiation into at least one of said laser gain medium elements.

19. (Amended) The laser module of Claim 14, wherein said at least one [are] is source[s] arranged for directing optical pump radiation into at least one of said peripheral edge of at least one of said laser gain medium elements.

20. (Amended) The laser module of Claim 19 further comprising at least one tapered optical duct disposed between [at least one of said sources] said at least one source of optical pump radiation and said peripheral edge, said tapered optical duct concentrating said optical pump radiation into said peripheral edge of said at least one laser gain medium element.

25. (Amended) The laser module of Claim 19 further comprising at least one lensing element disposed between said at least one [of said sources] source of optical pump radiation and said peripheral edge, said lensing element concentrating said optical pump radiation into said peripheral edge of said laser gain medium.

26. (Amended) A solid-state laser module comprising:

a) a cooled rigid substrate;

b) [at least one] a plurality of laser gain medium elements disposed [closely] adjacent to one another and against [said] a support surface, each of said laser gain medium elements effectively having a pair of surfaces having a first dimension, said pair of surfaces further being opposite to each other and being separated by a peripheral edge surface, each of said laser gain medium elements having a thickness representing a second dimension which is substantially smaller than said first dimension;

i) a first one of said pair of surfaces including an anti-reflection coating which is substantially [totally] transmissive of radiation at a wavelength at which laser gain is produced therein;

ii) said second [surface] one of said pair of surfaces including a coating which is substantially [totally] reflective of radiation at a laser gain wavelength;

iii) said second one of said pair of surfaces being attached to said support surface of said substrate and maintained so by a bonded joint; and

at least one source of optical pump radiation directing optical pump radiation into at least one of said laser gain medium elements.

31. (Amended) The laser module of claim 26, wherein said at least one [sources are] source is arranged for directing optical pump radiation into at least one of said peripheral edge of at least one of said laser gain medium elements.